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10/573,928	03/30/2006	Cristina Gomila	PU030162	5348

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EXAMINER	
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ART UNIT	PAPER NUMBER
2621	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/573,928	GOMILA ET AL.	
	Examiner	Art Unit	
	Tung Vo	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *03* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 February 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 March 2006* is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mukerjee et al. (US 7,609,763) in view of Hannuksela (2004/0228413) as set forth in the previous office action mailed on 11/12/2009 and clarification.

Re claims 1 and 10, Mukerjee teaches a method for the error detection and correction (col. 12, lines 43-45; the error detection and correction is used in the post-processing as deblocking filter, col. 13, lines 16-18) of at least one of a missing or corrupted macroblocks (the error data is detected in the error detection) in a video stream coded in direct mode (fig. 6, for direct mode), comprising the steps of:

identifying at least one missing or corrupted macroblock (col. 12, lines 43-45, note the error detection would obviously detect the missing or corrupt macroblocks in the compressed video steam);

finding a co-located macroblock in a first previously transmitted picture (1020 of fig. 10, see fig. 11);

determining a co-located motion vector for the co-located macroblock (1020 of fig. 1);

scaling the determined co-located motion vector in accordance with a picture distance (1030 of fig. 10);

predicting (930 of fig. 10) the at least one missing or corrupted data for the identified macroblock by motion compensating data from both the first previously transmitted picture (1130 of fig. 11) and a second previously transmitted reference picture (1140 of fig. 11) in accordance with the scaled co-located motion vector (col. 15, lines 1-35).

It is noted that Mukerjee does not particularly teach temporal error concealment for direct mode for ISO/ITU H.264 as claimed.

Hannuksela teaches temporal error concealment ([0044, 0046, 0050, and 0051] for direct mode ([0033, 0036], The decoding order of consecutive non-reference pictures can be recovered using the Picture Order Count (POC) concept of the JVT coding standard that is specified for each frame and field and it is used similarly to TR in direct temporal prediction of B slices, for example. POC is reset to 0 at an IDR picture) for ISO/ITU H.264 ([0008, 0078]).

Taking the suggested teachings Mukerjee and Hannuksela as a whole, it would have been obvious to one of ordinary skill in the art to modify the temporal error concealment in accordance to the ISO/ITU H.264 of Hannuksela into to the deblocking filter of Mukerjee to improve compression efficiency and error resiliency.

Re claim 2, Mukerjee further teaches wherein the at least one missing or corrupted data is predicted using a temporal-direct mode (col. 15, lines 20-25).

Re claim 3, Mukerjee further teaches wherein the at least one missing or corrupted data is predicted using one of the temporal and spatial-direct modes derivation processes in accordance

with at least one criterion selected prior to such predicting (1140 and 1130 of fig. 11, Backward and Forward motion vectors for prediction, figures 13 and 14).

Re claim 4 and 14, Mukerjee further teaches wherein selection of one of the temporal and spatial-direct modes derivation processes is made in accordance with concealment region size (fig. 14, a current macroblock).

Re claims 5 and 15, Mukerjee further teaches wherein selection of one of the temporal and spatial-direct modes derivation processes is made in accordance a derivation mode of neighboring slices (1430-1470 of fig. 14, the macroblock comprises slices neighboring around current).

Re claims 6 and 16, Mukerjee (modified by Hannuksela) further teaches wherein the at least one missing or corrupted data is predicted by the steps of: performing the temporal and spatial-direct modes derivation processes (e.g. 1000 of fig. 10) defined in the ITU H.264 coding standard (([0008, 0078] of Hannuksela); and selecting results of one of the temporal and spatial-direct modes derivation processes in accordance with at least one a posteriori criterion (a mode can be selected based on an efficiency evaluation of encoding/decoding the bi-directionally predicted image using one or more of the motion vector modes; col. 13, line 50-col. 14, line 4).

Re claim 7, Mukerjee further teaches deriving a size of blocks in the first and second pictures to which to apply the co-located motion vector (1020 and 1030 of fig. 10, see also fig. 11).

Re claims 8 and 17, Mukerjee (modified by Hannuksela) further teaches wherein the results are selected in accordance with a boundary strength value of de-blocking(the decoder applies a deblocking filter to the reconstructed frame to adaptively smooth discontinuities in the

blocks of the frame; col. 13, lines 16-18) in accordance with the ITU H.264 coding standard ((see [0008, 0078] of Hannuksela).

Re claims 9 and 11, Mukerjee (modified by Hannuksela) further teaches wherein the at least one missing or corrupted data is predicted using a temporal-direct mode (930 of fig. 9; col. 12, lines 65-67) defined in the ITU H. 264 coding standard ((see [0008, 0078] of Hannuksela) .

Re claim 12, Mukerjee (modified by Hannuksela) wherein the at least one missing or corrupted data is predicted using a spatial-direct mode(a mode can be selected based on an efficiency evaluation of encoding/decoding the bi-directionally predicted image using one or more of the motion vector modes; col. 13, line 50-col. 14, line 4) defined in the ITU H.264 coding standard((see [0008, 0078] of Hannuksela) .

Re claim 13, Mukerjee (modified by Hannuksela) wherein the at least one missing or corrupted data is predicted using one of the temporal and spatial-direct modes derivation processes defined in the ITU H.264 coding standard ((see [0008, 0078] of Hannuksela) in accordance the at least one criterion selected prior to such predicting (col. 13, line 50-col. 14, line 14).

3. Claims 1 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hannuksela et al. (US 6,744,924) in view of Hannuksela (2004/0228413).

Re claims 1 and 10, Hannuksela et al. (US 6,744,924) teaches a method for error concealment (46 of fig. 8) of at least one of a missing or corrupted macroblocks (dP4 of fig. 4) in a video stream coded in a predicting mode, comprising the steps of:

identifying at least one missing or corrupted macroblock (col. 8, lines 13-32, the corrupted areas, Pix4(i,j));

finding a co-located macroblock in a first previously transmitted picture (col. 7, lines 65-col. 8, line 13);

determining a co-located motion vector for the co-located macroblock (MVf, col. 8, lines 1-13);

scaling the determined co-located motion vector in accordance with a picture distance (MVf = TR);

predicting (35 of fig. 8) the at least one missing or corrupted data for the identified macroblock by motion compensating data from both the first previously transmitted picture (40a of fig. 8) and a second previously transmitted reference picture (40b of fig. 8) in accordance with the scaled co-located motion vector (col. 11, lines 13-22).

It is noted that Hannuksela et al. (US 6,744,924) does not particularly teach temporal error concealment for direct mode for ISO/ITU H.264 as claimed.

Hannuksela (2004/0228413) teaches temporal error concealment ([0044, 0046, 0050, and 0051] for direct mode ([0033, 0036], The decoding order of consecutive non-reference pictures can be recovered using the Picture Order Count (POC) concept of the JVT coding standard that is specified for each frame and field and it is used similarly to TR in direct temporal prediction of B slices, for example. POC is reset to 0 at an IDR picture) for ISO/ITU H.264 ([0008, 0078]).

Taking the suggested teachings both Hannuksela as a whole, it would have been obvious to one of ordinary skill in the art to modify the temporal error concealment in accordance to the

ISO/ITU H.264 of Hannuksela (2004/0228413) into to error concealment circuit of Hannuksela et al. (US 6,744,924) to improve compression efficiency and error resiliency.

Response to Arguments

4. Applicant's arguments filed 02/16/2010 have been fully considered but they are not persuasive.

The applicant argues that Mukerjee discloses one previous picture and on future image used for prediction B frame, Mukerjee does not disclose a first previously transmitted picture and a second previously transmitted reference picture; and Hanmuksela 1 does not teach multiple previous images for their image correction, there are no frames which use multiple previous images.

The examiner respectfully disagrees with the applicant. ***It is noted the applicant clearly discloses in the specification that a first previously transmitted picture and a second previously transmitted reference picture for B-frame prediction in direct mode (fig. 2), and the first previously transmitted picture (List 1 Reference of fig. 2) and the second previously transmitted reference picture (List 0 Reference of fig. 2), and wherein the second previous transmitted is selected from in accordance with reference index (List 0 Reference index of fig. 2).***

Mukerjee discloses the similar concept of a first previously transmitted picture (1130 of fig. 11) and a second previously transmitted reference picture (1140 of fig. 11) are transmitted from the encoder to decoder (fig. 9), and the first previously transmitted picture (1130 of fig. 11)

and second previously transmitted reference picture (1140 of fig. 11) both used for B prediction in the direct mode in accordance with the scaled co-located motion vector (col. 15, lines 1-35).

Hanmuksela 1 teaches two previously transmitted images ([0033, 0036], Note the decoding order of consecutive non-reference pictures can be recovered using the Picture Order Count (POC) concept of the JVT coding standard that is specified for each frame and field and it is used similarly to TR in direct temporal prediction of B slices, for example. POC is reset to 0 at an IDR picture), wherein the consecutive non-reference pictures would obviously be the two previously transmitted images, and Hanmuksela further teaches temporal error concealment ([0044, 0046, 0050, and 0051]) for direct mode using two previously transmitted images. Therefore, one skilled in the art would obviously combine the teachings of Mukerjee and Hanmuksela to make obvious claimed invention.

The applicant further argues that Mukerjee does not teach the claimed invention as specified in claims 3 and 13, 4 and 14.

The examiner respectfully disagrees with the applicant. It is submitted that Mukerjee discloses wherein the at least one missing or corrupted data is predicted using one of the temporal and spatial-direct modes derivation processes in accordance with at least one criterion selected prior to such predicting (1140 and 1130 of fig. 11, Backward and Forward motion vectors for prediction, figures 13 and 14, wherein the direct mode is selected as shown in figure 10, see also col. 1, lines 1-36); and wherein selection of one of the temporal and spatial-direct modes derivation processes is made in accordance with concealment region size (fig. 14, col. 21, lines 15-36, selection of motion vector resolutions and filter for B frames). The disclosure above meets the claimed language.

The applicant further argues Hanmuksela 2 does not teach predicting the at least one missing or corrupted data for the identified macroblock by motion compensating data from both the first previously transmitted picture and a second previously transmitted reference picture.

The examiner respectfully disagrees with the applicant. Hanmuksela teaches predicting the at least one missing or corrupted data for the identified macroblock (44 and 46 of fig. 8) by motion compensating data (MC 35 of fig. 8) from both the first previously transmitted picture and a second previously transmitted reference picture (fig. 3, wherein both the first previously transmitted picture (P3 of fig. 3) and a second previously transmitted reference picture (P2 of fig. 3) both used for a corrupted image (dP4 of fig. 3).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tung Vo whose telephone number is 571-272-7340. The examiner can normally be reached on Monday-Wednesday, Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on 571-272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tung Vo/
Primary Examiner, Art Unit 2621